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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,709	09/29/2003	Paul F. Stetson	009103-017410	4596

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EXAMINER	
KREMER, MATTHEW J	
ART UNIT	**PAPER NUMBER**
3736	

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/674,709	STETSON, PAUL F.	
	Examiner	Art Unit	
	Matthew J Kremer	3736	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *41-47,49-58,60 and 61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *41,42,44,46,49-51,53,55 and 60* is/are rejected.

7)☒ Claim(s) *43,45,47,52,54,56-58 and 61* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/16/2005 has been entered.

Claim Objections

2. Claims 49 are objected to because of the following informalities. In claim 49, line 1, "48" should be "41". In regard to claim 60, line 1, "59" should be "50". Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 41-42, 49-51, and 60 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 13-14 and 34-35 of U.S. Patent No. U.S. Patent 6,701,170 to Stetson in view of U.S. Patent No. 5,909,646 to Deville. In regard to claim 41 of the present application, claim 13 of Stetson claims a "method for measuring a physiological parameter, comprising: measuring a plurality of signals, wherein each of said signals comprises a source component corresponding to said physiological parameter and an interference component; processing said plurality of signals to obtain a plurality of principal components; processing said plurality of principal components to obtain a plurality of independent components, wherein a matrix of said plurality of signals corresponds to a matrix product of a matrix of said plurality of independent components and a matrix of mixing coefficients; and extracting a first measure of said physiological parameter corresponding to said source component from one of said plurality of independent components, wherein said plurality of signals corresponds to sensed optical energies from a plurality of wavelengths" (claim 1 of Stetson from which claim 13 of Stetson depends) and claims "obtaining a ratio of mixing coefficients from said matrix of mixing coefficients, wherein said ratio corresponds to a ratio of modulation ratios of red to infrared signals, wherein said plurality of signals comprise modulated optical signals in the red and infrared ranges" (claim 13 of Stetson). Claim 13 of Stetson does not claim the step of maximizing a function of third-order cumulants of a mixture of the plurality of

signal but does claim processing a matrix of mixing coefficients. Deville teaches that third-order cumulants are used to determine the mixing coefficients. (column 2, lines 24-29 and column 4, lines 37-40 of Deville). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the third-order cumulants in the claimed invention of Stetson since claim 1 of Stetson claims the use of a matrix of mixing coefficients and Deville teaches that third-order cumulants are used to determine the mixing coefficients.

In regard to claims 42 and 49 of the present application, claim 14 of Stetson claims "extracting a second measure of said physiological parameter from said ratio, wherein said second measure of said physiological parameter corresponds to an oxygen saturation".

In regard to claim 50 of the present application, claim 34 of Stetson claims a "pulse oximeter, comprising: a sensor configured for measuring a plurality of signals, wherein each of said signals comprises a source component corresponding to said physiological parameter and an interference component; a computer useable medium having computer readable code embodied therein for measuring a physiological parameter, said computer readable code configured to execute functions comprising: processing said plurality of signals to obtain a plurality of principal components; processing said plurality of principle components to obtain a plurality of independent components, wherein a matrix of said plurality of signals corresponds to a matrix product of a matrix of said plurality of independent components and a matrix of mixing coefficients; and extracting a first measure of said physiological parameter

corresponding to said source component from one of said plurality of independent components, wherein said plurality of signals corresponds to sensed optical energies from a plurality of wavelengths" (claim 20 of Stetson from which claim 34 of Stetson is dependent from) and claims "obtaining a ratio of mixing coefficients from said matrix of mixing coefficients, wherein said ratio corresponds to a ratio of modulation ratios of red to infrared signals"(claim 34 of Stetson). Claim 34 of Stetson does not claim the function of maximizing a function of third-order cumulants of a mixture of the plurality of signal but does claim processing a matrix of mixing coefficients. Deville teaches that third-order cumulants are used to determine the mixing coefficients. (column 2, lines 24-29 and column 4, lines 37-40 of Deville). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the third-order cumulants in the claimed invention of Stetson since claim 34 of Stetson claims the use of a matrix of mixing coefficients and Deville teaches that third-order cumulants are used to determine the mixing coefficients.

In regard to claims 51 and 60 of the present application, claim 35 of Stetson claims "extracting a second measure of said physiological parameter from said ratio, wherein said second measure of said physiological parameter corresponds to an oxygen saturation".

5. Claims 44 and 53 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 13 and 34 of U.S. Patent No. U.S. Patent 6,701,170 to Stetson in view of U.S. Patent No. 5,909,646 to

Deville, and further in view of U.S Patent 5,111,817 to Clark et al. (Clark); U.S Patent 5,553,615 to Carim et al. (Carim); and U.S Patent 5,398,681 to Kupershmidt. Claims 13 and 34 recite the limitation "an interference component" (claim 13, lines 5-6 and claim 34, line 5 of Stetson) but does not recite the definition of the limitation. It is well known in the art that optical medical measurements have interference due to ambient light and motion (column 14, lines 4-10 of Clark); respiration and physical movement between the sensor and tissue (column 6, lines 33-36 of Carim); and light scattering (column 15, lines 11-12 of Kupershmidt). These sources would fulfill the requirements of defining the interference component as set forth by Stetson. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to define the interference component as ambient light, motion, respiration and physical movement between the sensor and tissue, and light scattering since Stetson provides an interference component and Clark, Carim, and Kupershmidt define such interference component.

6. Claims 46 and 55 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 13 and 34 of U.S. Patent No. U.S. Patent 6,701,170 to Stetson in view of U.S. Patent Application Publication US 2002/0069242 to Berns. Stetson does not claim the use of a singular value decomposition. Berns teaches that a singular value decomposition reduces the dimensionality of a data set. (paragraph 0018 of Berns). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to

include a singular value decomposition as disclosed by Berns since it reduces the dimensionality of the data set.

Allowable Subject Matter

7. Claims 43, 45, 47, 52, 54, 56-58, and 61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter. In regard to claim 43, the prior art does not teach or suggest that "said processing said plurality of signals further comprises obtaining a time derivative of the sensed optical energies from a plurality of wavelengths" that is combined or combinable with the other limitations of claim 43. In regard to claim 45, the prior art does not teach or suggest that "said processing said plurality of signals further comprises decorrelating said plurality of signals by minimizing a cross-correlation of said plurality of signals, to obtain a plurality of decorrelated signals; and normalizing said plurality of decorrelated signals to obtain the plurality of principal components" that is combined or combinable with the other limitations of claim 45. In regard claim 47, the prior art does not teach or suggest that "said processing said plurality of signals comprises decorrelating said plurality of signals by multiplying said plurality of signals the inverse square root of the covariance matrix of said plurality of signals to obtain the plurality of principal components" that is combined or combinable with the other limitations of claims 47. In

regard to claim 52, the prior art does not teach or suggest that "said plurality of signals corresponds to the time derivative of the sensed optical energies from a plurality of wavelengths" that is combined or combinable with the other limitations of claim 52. In regard to claim 54, the prior art does not teach or suggest that "said processing said plurality of signals comprises decorrelating said plurality of signals by minimizing a cross-correlation of said plurality of signals, to obtain a plurality of decorrelated signals; and normalizing said plurality of decorrelated signals to obtain the plurality of principal components" that is combined or combinable with the other limitations of claim 54. In regard to claim 56, the prior art does not teach or suggest that "said processing said plurality of signals comprises decorrelating said plurality of signals by multiplying said plurality of signals by the inverse square root of the covariance matrix of said plurality of signals to obtain the plurality of principal components" that is combined or combinable with the other limitations of claim 56. In regard to claim 57, the prior art does not teach or suggest that "said processing said plurality of principal components comprises successive transformations to simultaneously minimize higher-order correlations among the outputs of the transformations" that is combined or combinable with the other limitations of claim 57. In regarding 58, the prior art does not teach or suggest that "said processing said plurality of principal components comprises successive rotations to minimize estimated mutual information among outputs of the invention" that is combined or combinable with the other limitations of claim 58. In regard to claim 61, the prior art does not teach or suggest that "said first measure of a physiological parameter

corresponds a pulse rate" that is combined or combinable with the other limitations of claim 61.

Response to Arguments

9. Applicant's arguments with respect to claims 41-42, 44, 46, 49-51, 53, 55 and 60 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Kremer whose telephone number is 571-272-4727. The examiner can normally be reached on Mon. through Fri. between 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on 571-272-4726. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ERIC F. WINAKUR
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